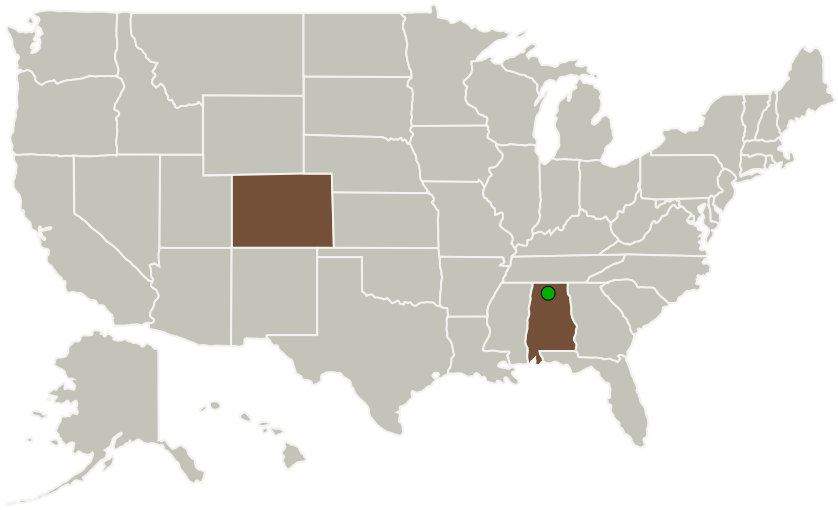
Industrial Scale Production of Celestial Body Simulants, Phase II

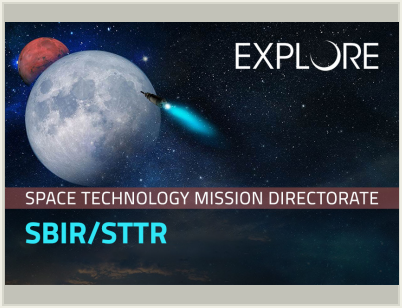
Completed Technology Project (2011 - 2013)

Project Introduction

The technical objectives of this program are to develop a cost-effective process to deliver Celestial body simulants for the foreseeable future. Specifically, the technical objectives of this project are: ↓ Deliver 3 metric tons of a lunar Mare simulant. A portion of the simulant will be bulk, excavation-grade that is compatible to the now depleted JSC-1a. Another portion of the simulant will be a technical grade simulant that has the proper amounts of glass and agglutinates included. Finally, a titanium-rich Mare will be produced. The correct concentrations of titanium are critical for mechanical and chemical process development and testing. ↓ After the 3 metric tons of Mare simulant; be able to produce bulk simulant at $10,000 per ton. This will be 30% better than the NASA cost target specified in the original solicitation. ↓ ZAP will deliver 1 metric ton of research grade Highlands type lunar simulant. ↓ ZAP will deliver a documented process for producing low-cost, bulk mare simulants. After phase 2 project, estimated cost is: $5,000 per ton. ↓ ZAP will test and demonstrate the applicability of the manufacturing process to produce other Celestial body materials. Examples include: Asteroid, Mars, probe reference samples, and dark glass.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Zybek Advanced Products, Inc.	Lead Organization	Industry	Boulder, Colorado
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

Primary U.S. Work Locations	
Alabama	Colorado

Project Transitions

June 2011: Project Start

May 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139111)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Zybek Advanced Products, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

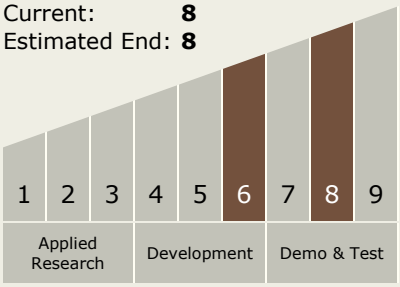
Carlos Torrez

Principal Investigator:

Michael Weinstein

Technology Maturity (TRL)

Start: **6**
Current: **8**
Estimated End: **8**



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Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.2 Mission Infrastructure, Sustainability, and Supportability
    - TX07.2.3 Surface Construction and Assembly

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System